

STUDIES IN THE RANUNCULACEAE OF THE SOUTHEASTERN UNITED STATES.

III. CLEMATIS L.^{1,2}

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While I was completing a treatment of the Ranunculaceae for the forthcoming *Vascular Flora of the Southeastern United States*, certain nomenclatural and taxonomic decisions were made; these call for additional clarification. This treatment of *Clematis* is conservative in that I am following a species concept allowing for considerable intraspecific population variability. Unless populations show discrete geographic patterns correlated with morphological discontinuities, I see no compelling reason to describe subspecies, varieties, etc. Furthermore, unless breeding studies suggest intraspecific relationships, I prefer to recognize morphologically-defined species. The aim throughout is to provide a rationale for certain taxonomic and nomenclatural conclusions, a key to the species, and data on their distribution in southeastern United States.

Clematis can be distinguished from other genera of Ranunculaceae by its opposite leaves, elongate and generally plumose styles, apetalous actinomorphic flowers, and usually four showy valvate petaloid sepals (Tamura, 1967). I am recognizing 16 species within the southeastern United States (as compared to about 300 species for the world; Buchheim, 1964), an area bounded by and including Louisiana, Arkansas, Kentucky, West Virginia, Maryland, and Delaware.

Aside from the taxonomic treatments by James (1883), Kuntze (1885), and Gray (1895), there have been no recent comprehensive treatments of *Clematis* of eastern North America. On the other hand, in recent years several groups represented in this region have been studied from a critical taxonomic standpoint, e.g., section *Viorna* (Erickson, 1943), the *C. ochroleuca* complex (Wherry, 1931; Fernald, 1943; Keener, 1967), and section *Atragene* in North America (Pringle, 1971). In addition, Fish (1970) studied megagametogenesis in 26 species of *Clematis* (including seven occurring within the southeastern United States) with a view toward examining certain taxonomic and

¹ Based on a manuscript and notes compiled for the forthcoming *Vascular Flora of the Southeastern United States*. In general, the format follows Radford *et al.* (1967). Any suggestions for improving this treatment should be sent to me so that necessary corrections and additions can be made before the *Vascular Flora* is in press.

² Contribution No. 121 from the Department of Biology, The Pennsylvania State University.

phylogenetic implications from his data. Nevertheless, there is still need for comparative biosystematic studies of the *C. virginiana* group in North America, *C. viorna* and its allies, and *C. crispa*. Moreover, although there are chromosome counts for 10 species (Table 1), counts for six species native to the southeastern United States are still lacking.

Table 1. Chromosome Numbers of the Species of *Clematis* in the Southeastern United States.

Species	Chromosome Number	Reference
<i>C. addisonii</i>	$2n = 16$	Gregory (1941)
<i>C. albicoma</i>	$2n = 16$	Keener (1966)
<i>C. baldwinii</i>	$2n = 16$	Keener (1974)
<i>C. catesbyana</i>	no report	
<i>C. coactilis</i>	$2n = 16$	Keener (1966)
<i>C. crispa</i>	$2n = 16$	Gregory (1941), Smith (1965)
<i>C. glaucophylla</i>	no report	
<i>C. maximowicziana</i>	$2n = 16$	Gregory (1941)
(= <i>C. paniculata</i> Thunb.,	$2n = 48$	Meurman & Therman (1939)
<i>C. dioscoreifolia</i> Levl. & Vaniot)	$n = 32$	Gregory (1941)
<i>C. occidentalis</i> (= <i>C. verticillaris</i> DC.)	$2n = 16$	Kurita (1956)
<i>C. ochroleuca</i>	$2n = 16$	Gregory (1941), Keener (1966)
<i>C. pitcheri</i>	no report	
<i>C. reticulata</i>	no report	
<i>C. versicolor</i>	no report	
<i>C. viorna</i>	no report	
<i>C. virginiana</i>	$2n = 16$	Lindsay (1929), Gregory (1941), Kurita (1958), Bostick (1965)
<i>C. viticaulis</i>	$2n = 16$	Keener (1966)

KEY TO SPECIES

- 1a. Flowers perfect or imperfect, numerous, in cymose-paniculate inflorescences; sepals whitish, spreading; filaments glabrous 2
- 1b. Flowers perfect, usually solitary; sepals variously colored, erect to somewhat spreading; filaments pubescent 4
- 2a. Flowers perfect; leaflets entire, seldom cleft, usually coriaceous; anthers 1.5 mm or more long 1. *C. maximowicziana*
- 2b. Flowers imperfect; leaflets coarsely toothed or lobed, usually membranous; anthers less than 1.5 mm long 3
- 3a. Leaves 3-foliolate; leaflets usually coarsely serrate, but seldom conspicuously 3-lobed; achenes light to dark brown or greenish brown 2. *C. virginiana*
- 3b. Leaves biternately compound or pinnately 5-foliolate; leaflets often conspicuously 3-lobed or toothed, the lobes entire to coarsely serrate; achenes reddish-brown to dark blackish-purple 3. *C. catesbyana*

- 4a. Sepals thin, slightly spreading, not connivent; leaves ternate; petaloid staminodia sometimes present. 4. *C. occidentalis*
- 4b. Sepals thick, usually erect and more or less connivent; leaves simple to pinnately compound; petaloid staminodia absent. 5
- 5a. Plants erect herbs; leaves usually simple, entire to deeply cleft, seldom all pinnate. 6
- 5b. Plants climbing vines or scrambling herbs, not erect; leaves commonly pinnately compound. 11
- 6a. Leaves green and usually pubescent beneath, the uppermost entire, lobed or cleft, neither pinnate nor tendril-bearing. 7
- 6b. Leaves glaucous and glabrous beneath, the uppermost commonly pinnate and tendril-bearing. 16. *C. addisonii*
- 7a. Leaves usually simple and entire, lanceolate to broadly ovate, the largest at least 2 cm wide; mature styles whitish to deep reddish-brown, the longest usually less than 5 cm long; mature peduncles usually less than 20 cm long. 8
- 7b. Leaves usually variously divided, or, if simple, linear to narrowly ovate, the largest segment or leaf usually less than 2 cm wide; mature styles light yellow, the longest more than 5 cm long; mature peduncles usually more than 20 cm long. 9. *C. baldwinii*
- 8a. Leaves of flowering material soft pubescent beneath, the largest 3-9 cm wide, hypostomatic; leaves of fruiting material usually light green with secondary and tertiary veins forming prominent reticulations on the upper surface. 9
- 8b. Leaves of flowering material scattered pilose to glabrous beneath, the largest 2-5 cm wide, amphistomatic; leaves of fruiting material often dark green with the secondary and tertiary veins not forming prominent reticulations on the upper surface. 10
- 9a. Stems and leaves villous; sepal backs moderately sericeous-pilose; mature styles yellowish-white to deep tawny, loosely spreading-recurved. 5. *C. ochroleuca*
- 9b. Stems and leaves usually densely holosericeous; sepal backs densely holosericeous; mature styles white to pale yellow, sharply recurved and flexuous. 6. *C. coactilis*
- 10a. Sepal backs villous; pubescence on carpel margins spreading; mature styles white to pale yellow, sharply recurved and flexuous. 7. *C. albicoma*
- 10b. Sepal backs finely puberulent; pubescence on carpel margins closely appressed-ascending; mature styles tawny to deep reddish-brown, loosely spreading-recurved. 8. *C. viticaulis*
- 11a. Leaflets generally coriaceous, the secondary and tertiary veins forming prominent reticulations on the upper surface. 12
- 11b. Leaflets thin, membranous, the secondary and tertiary veins forming faint or indistinct reticulations on the upper surface. 14
- 12a. Leaflets green and often soft-pubescent beneath; stem nodes and

- rachis joints finely to sparsely pubescent; sepal backs usually sericeous-canescenscent. 13
- 12b. Leaflets glaucous and glabrous beneath; stem nodes and rachis joints usually glabrous and glaucous; sepal backs usually glabrous. 12. *C. versicolor*
- 13a. Mature styles less than 3 cm long, glabrous or with appressed to spreading villous hairs, not evenly plumose throughout; leaflets generally subglabrous beneath, rarely densely soft-pubescent, more or less coarsely reticulate above. 10. *C. pitcheri*
- 13b. Mature styles more than 3 cm long, densely plumose with pilose hairs; leaflets soft-pubescent beneath, rarely glabrate, finely and prominently reticulate above. 11. *C. reticulata*
- 14a. Sepals usually (2-)3-5 cm long, dilated distally into thin broad crisped margins up to 6 mm wide; mature styles sericeous, finely appressed-pubescent, rarely evenly plumose; peduncles usually ebracteate. 13. *C. crispa*
- 14b. Sepals 1.2-2.5 cm long, the margins tomentose but not dilated distally; mature styles plumose; peduncles usually bracteate. 15
- 15a. Leaflets greenish and pubescent beneath; stem nodes and rachis joints pubescent; sepal backs finely pubescent. 14. *C. viorna*
- 15b. Leaflets glaucous and glabrous beneath; stem nodes and rachis joints glabrous and glaucous; sepal backs usually glabrous. 16
- 16a. Plants climbing vines; leaves seldom simple, often 6-10 foliolate. 15. *C. glaucophylla*
- 16b. Plants erect or ascending; lower leaves simple, upper simple to 2-6 foliolate. 16. *C. addisonii*

1. *C. MAXIMOWICZIANA* Franch. & Savat.

Thickets, fence rows, and waste places; widely scattered in pied. and cp., rarely mts. Ala., Ark., Ky., Md., Miss., N.C., S.C., Tenn., Va., W.Va. [Tex., Ill., Pa., N.J.]. *C. dioscoreifolia* Levl. & Vaniot—Fernald (1950), Gleason and Cronquist (1963), Radford (1968); *C. paniculata* Thunberg—Small (1933); incl. *C. d.* var. *robusta* (Carr.) Rehder—Fernald (1950). Cultivated escape; native to Japan.

Even though two widely used names for this species appear in current manuals, nevertheless *C. maximowicziana*, published in 1879 by A. R. Franchet and P. A. L. Savatier (Enum. Pl. Japon. 2: 261), clearly has priority over *C. dioscoreifolia* Levl. & Vaniot (Fedde, Repert. Nov. Sp. 7: 339. 1939; cf. Ohwi, 1965). Furthermore, *C. paniculata* Thunberg (Trans. Linn. Soc. 2: 337. 1794) is preempted by *C. paniculata* J. F. Gmelin (Syst. 873. 1791), a completely different species.

2. *C. VIRGINIANA* L., Virgin's-bower

Low woods, stream banks, thickets, and waste places; all prov. SE except Del. and Fla. [ALL except Okla. and N.J.].

A comprehensive comparative study of the population variability and breeding behavior of the short-styled virgin's-bowers is sorely needed. Pending such studies, I am recognizing three species, two in eastern North America (*C. catesbyana*, *C. virginiana*) and one in western North America (*C. ligusticifolia* Nutt.) outside the range covered by this paper. The three species are apparently closely related (Table II; also cf. Fish, 1970) but usually with mature fruiting material they can be distinguished. Nevertheless, intergradient forms occur, especially in Missouri, and, to date, the taxonomy of this complex is not completely clear.

3. *C. CATESBYANA* Pursh

Low sandy woods, river banks and upland woods; all prov. Ala. mts., Ark. mts., Fla., Ga. cp., Ky. IP., Miss. cp., N.C. cp. and pied., Va. mts. [Mo.]. Incl. *C. micrantha* Small—Small (1933), a small-flowered extreme; incl. *virginiana* L.—Radford (1968), in part; *C. ligusticifolia sensu* Radford, not Nuttall—Radford (1968).

On the basis of leaf and achene characters this species appears distinct (see Table II), even though herbarium material frequently passes as *C. ligusticifolia* or *C. virginiana*. A cytotaxonomic study of this species would be most instructive, especially in respect to its relationship with *C. virginiana*.

Clematis micrantha Small, erected to accommodate small-flowered plants occurring in west peninsular Florida, does not appear to be sufficiently distinct to warrant recognition.

4. *C. OCCIDENTALIS* (Hornemann) DC., Purple Clematis

Open woods, banks, rocky calcareous slopes and cliffs, rare; chiefly mts.

Del. cp., N.C., Va., [Ohio, Pa.]. *Atragene americana* Sims—Small (1933); *C. verticillaris* DC.—Fernald (1950), Gleason and Cronquist (1963), Radford (1968); incl. *C. v.* var. *cacuminis* Fern.—Fernald (1950).

Pringle (1971) in working through the taxonomy of *Clematis* section *Atragene* in North America critically reviewed the nomenclature and persuasively argued that the correct name for this distinctive species is *C. occidentalis* (Hornemann) DC. Pringle also showed that variety *cacuminis*, described by Fernald (1947) to accommodate small-flowering material collected from the Peaks of Otter, Bedford County, Virginia, was actually erected on the basis of immature material. Inasmuch as mature specimens from the same locality do not appear to differ significantly from collections made elsewhere, Pringle therefore regarded var. *cacuminis* as synonymous with *C. occidentalis* var. *occidentalis* (i.e., the wide-ranging eastern North American taxon).

5. *C. OCHROLEUCA* Aiton, Leatherflower, Curly-heads

Shaded woods, dry open banks and clearings; chiefly cp. and pied.

Ga., N.C., S.C., Va. *Viorna ochroleuca* (Aiton) Small—Small (1933).

The eastern short-stemmed leatherflowers (nos. 5, 6, 7, 8; Table III) have been critically studied by Wherry (1931), Fernald (1943), and Keener (1967).

Table II. Comparison of Species in the *C. virginiana* Complex.

Character	<i>C. virginiana</i>	<i>C. catesbyana</i>	<i>C. ligusticifolia</i>
Leaves	3-foliolate	5-foliolate to biternate	Pinnately (3-)5-7 foliolate; rarely biternate
Leaflets: color		Usually green to dark green	Pale to yellowish-green
length (cm)	2-10	3-6	(2-)3-6(-8)
shape	Ovate to subcordate	Subcordate to \pm lanceolate	Lanceolate to lance-ovate or ovate
margin	Usually coarsely serrate	Usually 3-lobed to entire	Usually coarsely few-toothed or lobed
texture		Membranous	Membranous to coriaceous
pubescence	Glabrous to villous on veins beneath, plus scattered to abundant pubescence over entire abaxial surface		Sparingly strigose on veins beneath, otherwise usually glabrous
stomates		Lower leaflet surface	Upper and lower leaflet surfaces
Peduncles: length (cm)	2-6 (avg. :3.9)	3.5-8 (avg. :4-7)	4-7 (avg. :5.3)
pubescence	Glabrous to tomentose; hairs short (0.3-0.5 mm)	Tomentose; hairs short (ca. 0.3 mm)	Villous; hairs both long (0.5-0.7 mm) and short

Table II. Continued.

Character	<i>C. virginiana</i>	<i>C. catesbyana</i>	<i>C. ligusticifolia</i>
Sepals:			
length	Often longer than the fertile stamens		Often shorter than the fertile stamens
shape	Oval to oblong-spatulate	Linear to obovate	Narrowly oblong-lanceolate
Achenes:			
color	Light to dark brown or greenish brown	Reddish or purplish-brown to dark blackish-purple	Light brown to deep reddish-brown
pubescence	Sparingly short pilose to villous hirsute		Densely pilose to crisp hairy
Chromosome number	$2n = 16$	No report	$2n = 16$
Range	Eastern North America	Va. to Ky., south to Ark. and Fla.	Western North America

As a group they are erect herbs (2-6 dm tall) with simple usually entire leaves and with mature fruits having plumose styles less than 5 cm long. Although these plants appear to be closely related, their evolutionary relationships remain relatively obscure (Keener, 1967, 1970). Still, with mature fruiting material, the four species can be determined readily (See Table III).

6. *C. COACTILIS* (Fernald) Keener

Shale barrens and thin limestone woods, rare; RV. West-central Va.
C. albicoma Wherry var. *coactilis* Fern.—Fernald (1950), Gleason and Cronquist (1963).

This species combines the features of both *C. ochroleuca* (as to vegetative habit and leaf morphology) and *C. albicoma* (fruits) but differs by the pronounced pubescence on the stem, leaves, and sepals (Table III; Keener, 1967). *Clematis coactilis* is a rare species, occurring only in western Virginia, and it may represent a hybrid derivative of *C. ochroleuca* and *C. albicoma* (Keener, 1967, 1970). Until careful breeding studies involving all three taxa are undertaken, the evolutionary relationships of *C. coactilis* will remain obscure.

7. *C. ALBICOMA* Wherry, Leatherflower

Shale barrens, rare; RV. Western Va. and adjacent W.Va.

This is one of several strict shale barren endemics occurring only on exposed south-facing outcrops of Upper Devonian shales in Virginia and adjacent West Virginia (Keener, 1970). Although *C. albicoma* is relatively distinct from *C. ochroleuca* and *C. coactilis*, it appears to be closest to the extremely rare *C. viticaulis* (Keener, 1967).

8. *C. VITICAULIS* Steele

Shale barrens, very rare; RV. Western Va.

This species, restricted to only a few shale barrens in Bath and Rockbridge counties in western Virginia, is the rarest *Clematis* in the southeastern United States. It is closest to *C. albicoma* but differs from that species by its finely puberulent sepal backs and usually deep reddish-brown styles ("achene tails").

9. *C. BALDWINII* Torrey & Gray

Sandy flat pine woods; cp. Fla. *Viorna baldwinii* (Torrey & Gray)
Small—Small (1933).

This distinctive species is restricted to peninsular Florida. Long (1970) pointed out that population studies of *C. baldwinii* would be most desirable, especially to assess leaf shape and sepal size throughout the range. Although he recognized the larger flowered and broader leaved plants as var. *latiuscula*, there appears to be no geographic correlation with respect to the two varieties. Therefore, pending additional field study, I prefer to regard *C. baldwinii* as a unitary polymorphic species.

10. *C. PITCHERI* Torrey & Gray

Low grounds, woods and thickets; all prov. Ark., Ky. ME. and IP., Tenn. IP. [Tex., Okla., Mo., Ill., Ind.]. *Viorna pitcheri* (Torrey & Gray) Small—Small (1933).

Clematis pitcheri is a wide-ranging mid-central North American species having considerable morphological variability (Erickson, 1943). It enters the western portion of the range, occurring in Arkansas and in western Kentucky and Tennessee. Frequently *C. pitcheri* is confused with *C. reticulata* but the two species are generally readily separable (Table IV).

11. *C. RETICULATA* Walter

Dry sandy woods and thickets; chiefly cp. and pied. Ala., Ark., Fla., Ga., La., Miss., S.C., Tenn. IP. [Tex.]. *Viorna reticulata* (Walter) Small—Small (1933); incl. *V. subreticulata* Harbison ex Small, *V. beadleii* Small—Small (1933).

This variable species occurs throughout the southeastern United States; a thorough population study is needed. There is some variation in the degree of reticulation of the venation pattern on the adaxial surfaces of the leaves, leading Small (1933) to segregate additional species (as *Viorna subreticulata* Harbison ex Small, *Viorna beadleii* Small). However, pending further analysis, it seems best to regard *C. reticulata* as a widespread polymorphic species.

Except for its viny habit, *C. reticulata* appears similar to *C. ochroleuca*. Furthermore, *C. reticulata* is confused with *C. pitcheri*, but the two species can usually be distinguished especially with mature material (Table IV). In any case, their ranges generally do not overlap (cf. Erickson, 1943).

12. *C. VERSICOLOR* Small ex Rydberg

Dry rocky woods, bluffs and barrens; all prov. Ark., Ky. IP., Tenn. ME. and IP. [Okla., Mo.].

Clematis versicolor is one of three species of viny *Clematis* having generally pronounced adaxial leaf reticulations. It differs from *C. pitcheri* and *C. reticulata*, however, by having both glabrous and glaucous abaxial leaf surfaces, leaf rachises, and stem nodes (Table IV). Aside from its prominent venation pattern, *C. versicolor* apparently is closely related to *C. glaucophylla* and *C. addisonii*. Both *C. pitcheri* and *C. versicolor* should be carefully studied from a population standpoint, especially in Arkansas.

13. *C. CRISPA* L., Leatherflower, Blue-jasmine

Low woods, swamps and creek bottoms; chiefly cp. and pied. SE except Del., Md., and W.Va. [Tex., Okla., Mo., Ill.]. *Viorna crispa* (L.) Small—Small (1933); incl. *V. obliqua* Small—Small (1933).

Clematis crispa frequently occurs on the coastal plain and piedmont throughout the southeastern United States. It is readily distinguished by its thin leaves, typically large crisped-margined sepals, sericeous styles, and

Table III. Comparison of Species in the *C. ochroleuca* Complex.³

Character	<i>C. ochroleuca</i>	<i>C. coactilis</i>	<i>C. albicoma</i>	<i>C. viticaulis</i>
Stem pubescence	Silky pilose	Densely holosericeous	Tomentose to loosely pilose	Usually finely hirtellous
Axillary branches	Seldom overtopping the central axis		Usually overtopping the central axis	
Leaves (fruiting specimens):				
color	± Light green		± Dark green	
shape	Narrowly to broadly ovate		Narrowly ovate to elliptic-lanceolate	
width x length (cm)	3-8 x 4-12	4-9 x 6-11	2-5 x 4-8	2-3.5 x 4-7
pubescence	Soft pubescent beneath		Scattered pilose to glabrate beneath	
texture	± Coriaceous		Membranous to coriaceous	
venation	± Strongly yellowish-reticulate on upper surface		Scarcely yellowish-reticulate on upper surface	
stomates	Lower surface		Both surfaces	
Sepal pubescence (abaxial surface)	Moderately sericeous-pilose	Densely holosericeous	Villous	Finely puberulent
Achene rim pubescence	Strongly appressed-ascending		± Spreading	Closely appressed-ascending

Table III. Continued.

Character	<i>C. ochroleuca</i>	<i>C. coactilis</i>	<i>C. albicoma</i>	<i>C. viticaulis</i>
Mature styles:				
color	Yellowish-white to deep tawny		White to pale yellow	Tawny to deep reddish-brown
disposition	± Loosely spreading recurved; heads ± spherical		Usually sharply recurved and flexuous; heads compact, ± flattened	Loosely spreading-recurved; heads ± spherical
Habitat	Shaded woods, dry open banks and clearings; often in soils derived from basic rock	Shale barrens; rarely in calcareous soils	Shale barrens	Shale barrens
Range	Staten Island, N.Y., Va., N.C., S.C., Ga.	Four counties in west-central Va.	Western Va. and eastern W.Va.	Bath and Rockbridge counties, Va.

³ Based on Keener (1967).

Table IV. Comparison of *C. pitcheri*, *G. reticulata*, and *C. versicolor*.⁴

Character	<i>C. pitcheri</i>	<i>C. reticulata</i>	<i>C. versicolor</i>
Similar features	Vines with \pm coriaceous leaflets having a prominent reticulate venation on the adaxial surface		
Node pubescence	Finely to sparsely pubescent		Usually glabrous and glaucous
Leaflets:			
color		Green beneath	Glaucous beneath
pubescence	Glabrous to soft pubescent beneath	Soft pilose to glabrate beneath	Glabrous beneath
shape	Lance-ovate to broadly cordate-ovate	Ovate to elliptical or subcordate	Ovate-oblong to cordate-ovate
apex	\pm Acute-tipped	Rounded to acute	
venation (adaxial surface)	\pm Coarsely reticulate	Usually finely and closely reticulate	\pm Closely reticulate
Sepals:			
abaxial surface		Usually sericeous-canescenscent	Nearly glabrous
color	Dull purple to dark red	Purplish-red or bluish to pink-lavender	Dull purple to blue lavender
Mature styles:			
length (cm)	1-3 (often broken)	4-6	5-6
pubescence	Nearly glabrous to appressed silky or villous, not plumose	Plumose with pilose hairs	
Range	Ind. to Iowa, s. to w. Ky., w. Tenn., Ark., and Tex.	S.C. to Tenn. and Ark., s. to Fla., Ala., Miss., La., and Tex.	Ky. to Mo. and se. Okla., s. to w. Tenn. and Ark.

⁴ Based in part on Erickson (1943).

ebractate peduncles. This species shows considerable variability, reflected by the segregate taxa of earlier workers, e.g. *C. crispa* var. *walteri* (Pursh) Gray, a morph with linear-lanceolate leaflets, and *Viorna obliqua* Small, described as having smaller, scarcely crisped-margined sepals. Although careful study of population variability might reveal definable geographic variants, I am currently treating *C. crispa* as a single polymorphic species.

14. C. VIORNA L., Leatherflower

Rich wooded banks and thickets; all prov. SE except Fla. and La. [Mo., Ill., Ind., Ohio, Pa.]. *Viorna viorna* (L.) Small—Small (1933); incl. *V. gattingeri* Small and *V. flaccida* Small—Small (1933) and *C. v.* var. *flaccida* (Small) Erickson—Fernald (1950).

The wide-ranging *C. viorna* can be distinguished by its viny habit, membranous soft-pubescent leaves, pubescent nodes and leaf rachises, bracteate peduncles, finely pubescent sepal backs, and plumose styles. It is somewhat variable, especially with respect to leaf size and pubescence and sepal size, a fact reflected in two segregate taxa described by Small. *Viorna* (= *Clematis*) *gattingeri* Small, collected from the banks of the Cumberland River near Nashville, Tennessee, was erected on the basis of its smaller flowers and leaflets and glandular pubescence (an incorrect observation by Small; cf. Erickson, 1943). A second species, *Viorna* (= *Clematis*) *flaccida* Small (= *C. viorna* var. *flaccida* (Small) Erickson), was based on plants originally collected in Warren County, Kentucky and that were characterized by their large membranous entire velvety-pubescent leaves. Both species do not appear sufficiently distinctive to warrant taxonomic recognition. Nevertheless, critical population studies of *C. viorna*, especially in central Tennessee and adjacent Kentucky, would be instructive and might reveal more precisely taxonomically definable topogamodemes.

15. C. GLAUCOPHYLLA Small

Rich woods and river banks; all prov. Ala., Ark., Fla., Ga., Ky., Miss., N.C., S.C., Tenn. [Okla.]. *Viorna glaucophylla* (Small) Small—Small (1933).

Even though *C. glaucophylla* and *C. addisonii* share the membranous leaflet character of *C. viorna*, they can be distinguished from that species by their glabrous and glaucous leaves, rachis joints, and stem nodes and by their usually glabrous sepal backs. *Clematis glaucophylla* is a rare, morphologically variable species in need of critical biosystematic study, especially in relation to *C. versicolor* and *C. addisonii*. Particularly helpful in this regard would be population studies of the glaucous-leaved leatherflowers from central Tennessee and adjacent Kentucky (cf. Erickson 1943, p. 21).

16. C. ADDISONII Britton

Dry limestone hillsides and wooded banks, rare; RV. West-Central Va. *Viorna addisonii* (Britton) Small—Small (1933).

This very rare species is closest to *C. glaucophylla*. It is quite variable in

habit; e.g., in the same population some plants may be small and erect with only simple leaves, whereas other plants may be more or less viny, up to 1 m long, and with both simple lower leaves and upper 2-6 foliolate pinnately compound ones (Keener, unpubl. data). A critical comparative study of *C. addisonii* with *C. glaucophylla* is required before its taxonomic status can be fully ascertained (cf. Gleason and Cronquist, 1963, p. 319). Pending such analysis, I am retaining *C. addisonii* as a species restricted to dry calcareous hills and banks in a few counties in west-central Virginia.

ACKNOWLEDGMENTS

Special thanks are due Dr. R. A. Pursell, Monte Manuel, and Paul Rothrock for criticizing an earlier draft of this paper. Any remaining errors of fact or judgment are my responsibility.

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